### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

November 14, 2011

TO:

Chris Lanane, Dan Johnson

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Coso Jct., November 14, 2011," for your review. Please refer any comments you may have on the document to me by January 16, 2012. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

## Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

### SITE: COSO JUNCTION

Report Date: November 14, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Coso Junction was audited on November 14, 2011. The audit was conducted by Mike Horn and was witnessed by Dan Johnson who is the site operator.

### 2.0 Parameters Audited:

#### T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

### Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	11/14/11					
Date:	11/14/11				Coso Junction	
Start:	11:35hrs. <b>PST</b>			*	Dan Johnson	
Finish:	11:50hrs. PST	1		Project: S		
Audited By:	Mike Horn			Site Elevation:	3368	ft.
Witness:	Dan Johnson			Amb. Pres.:	900.30	
				Amb. Temp.:	14.7	deg. C
Prop. or Serial No.:	22618			Make:	R & P	
Type:	PM-10			Model:	1400ab	
				Last cal. date:	9/8/11	
	AUDIT	DEVICE(S)				
Make:	BGI Incorporated			Make: I	3GI Incorporated	
Model:	DELTA CAL			Model: I	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lpm	L		Range:	2 - 20	lpm
•	Calibration Factors			(	Calibration Factor	'S
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff,
Leak check:	0.070	0.200	15.8	1.1	891.44	-8.9
Dark current:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} + b$		Site		Nominal	Flow Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.51	16.51	16.68	1.0	15.0	18.4
Bypass/Aux Flow Rate	13.43	13.43	13.69	1.9		
Main Flow Rate	2.99	2.99	2.99	0.0	2.7	3.3
Total Flow Rate	16.53	16.53	16.68	0.9	15.0	18.4

Comments: None.

### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt Variable	Evaluation Criteria
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	e	input $\pm$ 0.5° C Gravimetry Lab $\pm$ 1.0 deg. C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	1	input ± 10%
Barometric l	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi-V PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM

Appendix B

### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CU10, HS10	8/30/11	N/A	N/A
Psychro-Dyne Psychrometer:	RH 04	N/A	1	
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

			asin Unified A				
	T;	apered	Element Oscil		lance (TEOM)	74 HEVA 2 1	
			FLO	W AUDIT			11.000
Date:	the second secon			Site Name	: Cason	1	
Start:		PST		Operator	: Jyan lo	hnom	
Finish:	11:35	PST		Project	: SB270	12.00.1	
	11:50			Site Elevation	:	ft	†
	01		T	Amb. Press.	9003	in. Hg	
				Amb. Temp.		deg. C	
					1-1-1-		
Prop. Or Ser. No.:	22618			Make	R&P		
Type:	PM10				1400a		
				Last Cal. Date:			
				1	199		-
		Audit I	Device(s)				
Make:	BGI_INCOR			Make:	BCT THEOR	DODATES	-
Model	DELTA CAL	LUKALI	Ψ	Model:	THE THEORY	EUKATED_	
S/N:	0123 5	75	1	S/N:	DELLIA VAL		
Range:					U163	Leave	
Calibration factors:	2 - 20	lpm	C-101	Range:	2 - 20	ipm	
			Calibi	ration factors:			
Slope:	1.0			Slope:	1.0		
Int.:	9-19-1			Int.:	0.0		
Cal Date:	44/1	-		Cal Date:	س		
				L		//	
Q <sub>a</sub> =m[d	IPxT <sub>a</sub> /P <sub>a</sub> J <sup>1/2</sup> +b		Altitude Corre	ection Factor:	-1013		
Control of the contro				(			
Leak Check-Initial	Main:	.07	Aux:	,20			
Leak Check-Final	Main:	1	Aux:				
			Site		Nominal Fl	ow Rates	
Audit	Audit Flow	Rate	Flow Rate	Diff.		Upper Limit	
Point		(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Fow Rate	1/ 61		2 99/13	19-11	/4 15.0	18.4	
Aux. Flow Rate	13 112	-	13.64	16.	00	10.4	
Main Flow Rate	15'00		2.95		2.7	3.3	
Total Flow Rate	11 55						
· · · · · · · · · · · · · · · · · · ·	16.53		16.60		15.0	18.4	
				da ud			
	Sampler		Stand	Raw			
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Amh Tomp	16 4			111.7			
Amb Temp	15.8	:	sat m	14.7			
Amb Temp Amb Press	15.8		891.44	900.3			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
	15.8		891.44	14.7			
Amb Press	15.8		891.44	14.7			
	15.8		891.44	14.7			
Amb Press	15.8		891.44	14.7			
Amb Press	15.8		891.44	14.7			
Amb Press	15.8		891.44	14.7			
Amb Press	15.8		891.94	14.7			
Amb Press	15.8		891.94	14.7			
Amb Press	15.8		891.94	14.7			

### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

July 20, 2011

TO:

Chris Lanane, Dan Johnson

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Coso Jct., July 20, 2011," for your review. Please refer any comments you may have on the document to me by September 20, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

### Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

### SITE: COSO JUNCTION

Report Date: July 20, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Coso Junction was audited on July 20, 2011. The audit was conducted by Mike Horn and was witnessed by Dan Johnson who is the site operator.

### 2.0 Parameters Audited:

### T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

Coso Junction Audit Report July 20, 2011 Page 3

APPENDIX A

### Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	7/20/11					
Date:	7/20/11			Site name:	Coso Junction	
Start:	11:30hrs. PS	Т		Operator: 1	Dan Johnson	
Finish:	11:50hrs. PS	Т		Project:	SB 270	
Audited By:	Mike Horn			Site Elevation:	3368	ft.
Witness:	Dan Johnson			Amb. Pres.:	898.50	hPa
				Amb. Temp.:	33.8	deg. C
Prop. or Serial No.:	22618			Make:	R & P	
Type:	PM-10			Model:	1400ab	
				Last cal. date:	5/24/11	
	AUDI	T DEVICE(S)				
Make:	BGI Incorporated			Make: 1	BGI Incorporated	
Model:	DELTA CAL			Model:	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 lpr	n		Range:	2 - 20	lpm
7=	Calibration Factors			V.	Calibration Factor	rs
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	<u>Diff.</u>	Sampler press:	Diff.
Leak check:	0.080	0.220	33.8	0.0	892.46	-6.0
Dark current:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} + b$		Site		Nomina	l Flow Rates
Audit	Audit Flow	Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.64	16.64	16.66	0.1	15.0	18.4
Bypass/Aux Flow Rate	13.56	13.56	13.67	0.8		
Main Flow Rate	3.00	3.00	2.99	-0.3	2.7	3.3
Total Flow Rate	16.61	16.61	16.66	0.3	15.0	18.4

Comments: None.

### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	nt V <u>ariable</u>	Evaluation Criteria
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direct	ion	input ± 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatur	re	input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers
Relative Hu	midity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitation	n	input ± 10%
Barometric	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi- PM-2.5	Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
ТЕОМ:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%

Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Leak Check

TEOM:

Appendix B

### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

T	apered		ir Pollution Co lating Microba			
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1 1						
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PM10						
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13.56		13.67				
3.00		2,77		2.7		
16-61		16,66		15.0	18.4	
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### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

May 24, 2011

TO:

Chris Lanane, Dan Johnson

FROM:

Mike Horn///

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Coso Junction, May 24, 2011," for your review. Please refer any comments you may have on the document to me by July 25, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

## Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

### <u>SITE:</u> COSO JUNCTION

Report Date: May 24, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Coso Junction was audited on May 23, 2011. The audit was conducted by Mike Horn and was witnessed by Dan Johnson who is the site operator.

### 2.0 Parameters Audited:

T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

APPENDIX A

### Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) AUDIT

Date of report:	5/24/11					
Date:	5/23/11			Site name:	Coso Junction	
Start:	11:00hrs. <b>F</b>	PST		Operator:	Dan Johnson	
Finish:	11:20hrs. I	PST		Project:	SB 270	
Audited By:	Mike Horn			Site Elevation:	3368	ft.
Witness:	Dan Johnson			Amb. Pres.:	892.70	hPa
				Amb. Temp.:	24.3	deg. C
Prop. or Serial No.:	22618			Make:	R & P	
Type:	PM-10			Model:	1400ab	
				Last cal. date:	3/31/11	
	AUI	OIT DEVICE(S)				
Make:	BGI Incorporated			Make:	<b>BGI</b> Incorporated	
Model:	DELTA CAL			Model:	DELTA CAL	
S/N:	525			S/N:	525	
Range:	2 - 20 1	pm		Range:	2 - 20	lpm
	Calibration Factors	_			Calibration Factor	rs
Slope:	1.00			Slope:	1.00	
Intercept:	0.00			Intercept:	0.00	
Cal date:	1/4/11			Cal Date:	1/4/11	
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.
Leak check:	0.080	0.210	24.8	0.5	885.36	-7.3
Dark current:	N/A	N/A				
	$Qa = [dPxTa/Pa]^{1/2} +$	-b	Site		Nomina	Flow Rates
Audit	Audit Flo	w Rate,	Flow Rate	Diff.	Lower Limit	Upper Limit
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)
Total Flow Rate	16.56	16.56	16.66	0.6	15.0	18.4
Bypass/Aux Flow Rate	13.54	13.54	13.67	1.0		
Main Flow Rate	3.03	3.03	2.99	-1.3	2.7	3.3
Total Flow Rate	16.53	16.53	16.66	0.8	15.0	18.4

Comments: None.

### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measureme	ent Variable	Evaluation Criteria
Wind Speed	d	At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H
Wind Direc	rtion	input $\pm$ 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor
Temperatu	re	input $\pm~0.5^{\circ}$ C input $\pm~2.0^{\circ}$ C for PM-10, PM-2.5 samplers
Relative Hu	umidity	Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%
Precipitatio	on	input $\pm 10\%$
Barometric	Pressure	Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury
PM-10: Hi- PM-2.5	-Vol SSI, Partisol, BGI,	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%
TEOM:	Leak Check	Main Flow: < 0.15 LPM

Bypass Flow: < 0.60 LPM

Appendix B

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL:	123	1/24/11	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1	12/3/10	N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		
Chinook Eng. Streamline FTS	108	9/8/10	0.41	0.6

	T	apered	Element Osci	llating Microba	alance (TEOM)	****		
				TIQUA WO			TF 55 100 0	6 100
						T	T	T
Date	5/23/1			Site Name	Char	0		_
Star	11.00	PST		Operator		Rohnsa	1	+
Finish	: 11:00	PST			: SB270 C	govinia		
	11-00	1		Site Elevation		ft		
				Amb. Press.		in. Hg		
				Amb. Temp.	1 100 100	deg. C		- 1
		1	<del></del>	- rano. remp.	44.7	deg. C		-ļ
Prop. Or Ser. No.	226/8	1		Make	: R&P			
	PM10	-			: 1400a /			_
13,00		-		Last Cal. Date				
	-	-	<del> </del>	Last Cal. Date	3/31/11			
		Accelle	Davisate					
Make	DOX YES	Mudit	Device(s)	1		J		
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Model:		19 /	1	Model:	DELTA CAL			
S/N:		15		S/N:	0123			
Range:	2 - 20	ipm		Range:	2 - 20	lpm		
Calibration factors:			Calib	ration factors:				
Slope:	1.0			Slope:	1.0			-
Int.:	0.0 /			Int.:				1-
Cal Date:	1/4/11			Cal Date:	U.U.		-	-
	and of the form							1-
Q.=mfe	PxT_/P_J1/2+b		Altitude Corr	ection Factor:	- 1013			
			radiace con	Tactor.	÷ 1013			
Leak Check-Initial	Main:	14	Aux:	A7				
Leak Check-Final	Main:	.08	Aux:	.21				
Ecak Official Itial			Aux.					
Audit			Site		Nominal F			
501.000000	Audit Flow		Flow Rate	Diff.	Lower Limit	Upper Limit	1200 - 2010 PG 1810 - 1	
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)		
Total Fow Rate	16.56.		2.99/13-6	1=16.60	15.0	18.4		
Aux. Flow Rate	13.54		13.167	, ,,,,,,,				†
Main Flow Rate	3.03/		099		2.7	3.3		+
Total Flow Rate	16.53		16 66		15.0	18.4		
			16.66			****		
			Stan	dard				
	Sampler		True	Raw				-
Amb Temp	244	(2)		142				-
Amb Press	871	-	885.36	897				
	-0/7		000.00	0101				ļ
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Comments:			—···					
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Comments:								

### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

### MEMORANDUM

DATE:

January 14, 2011

TO:

Chris Lanane, Dan Johnson

FROM:

Mike Horn

SUBJECT:

Quality Assurance Audit Report

Attached is the draft version of the document, "Great Basin Unified Air Pollution Control District Quality Assurance Audit Report, Coso Junction, January 14, 2011," for your review. Please refer any comments you may have on the document to me by March 14, 2011. If no comments are received by that date, the report will be considered final.

Thank you for your cooperation in this matter.

# Great Basin Unified Air Pollution Control District Quality Assurance Audit Report

### SITE: COSO JUNCTION

Report Date: November 14, 2011 Prepared by: Mike S. Horn

### 1.0 Introduction

As part of the Great Basin Unified Air Pollution Control District's (District) quality assurance (QA) program, periodic audits are conducted on the monitoring stations throughout the District. These checks, which are conducted by personnel other than those associated with the day-to-day operation and maintenance of the stations, provide additional assurance that the data collected are of high quality and meet the project objectives. The achievement of these objectives can be determined, in part, by establishing criteria within which monitoring equipment is to be operated and then testing that equipment regularly to verify its operation within those criteria.

In keeping with the District's QA program goals, the T.E.O.M. PM-10 Monitoring Station at Coso Junction was audited on January 12, 2011. The audit was conducted by Mike Horn and was witnessed by Dan Johnson who is the site operator.

### 2.0 Parameters Audited:

T.E.O.M. PM-10

### 3.0 Results and Actions

The results of the audit are summarized below. Any problems found are addressed under the heading, "Action," and are given below. Sensor responses not specifically addressed below responded within the audit criteria limits. The audit data are presented in detail in Appendix A. The certifications of the audit devices are presented in Appendix B. Audit criteria based on Title 40 code of Federal Regulations Part 58, Appendix A (October 2006), the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems Volumes II, 1997, and IV, 2007, and/ or on the manufactures recommendations, are presented in table A-1.

### 4.0 Recommendations and Comments

There are no recommendations or comments at this time.

Coso Junction Audit Report January 14, 2011 Page 3

APPENDIX A

## Great Basin Unified Air Pollution Control District Tapered Element Oscillating Microbalance (TEOM) ${\bf AUD}\Pi$

Detector	1/1//11						
Date of report:	1/14/11			C:1	Con I with a		
Date:	1/12/11	nom.			Coso Junction		
Start:	11:45hrs.			-	Dan Johnson		
Finish:	12:00hrs.	PST		Project:			
Audited By:	Mike Horn			Site Elevation:	3368		
Witness:	Dan Johnson			Amb. Pres.:	909.70		
				Amb. Temp.:	7.5	deg. C	
Prop. or Serial No.:	22618			Make:	R & P		
Type:	PM-10			Model:	1400ab		
				Last cal. date:	12/13/10		
	AU	DIT DEVICE(S)					
Make: BGI Incorporated				Make:	Make: BGI Incorporated		
Model:	Model: DELTA CAL			Model:	l: DELTA CAL		
S/N:	123			S/N:	123		
Range:	2 - 20 ]	lpm		Range:	2 - 20	lpm	
Calibration Factors				Calibration Factors			
Slope:	1.00			Slope:	1.00		
Intercept:	0.00			Intercept:	0.00		
Cal date:		Date ot first use 1	1/12/11	Cal Date:	12/22/09		
	Main:	Aux:	Sampler temp:	Diff.	Sampler press:	Diff.	
Leak check:	0.070	0.200	7.9	0.4	905.62		
Dark current:	N/A	N/A	7.2	0.1	700.02	1.1	
	$Qa = [dPxTa/Pa]^{1/2}$	·	Site		Nominal	Flow Rates	
Audit	Audit Flo	Audit Flow Rate,		Diff.	Lower Limit	Upper Limit	
Point	ΔP, in. H2O	(VLPM)	(VLPM)	(%)	(LPM)	1.1	
Total Flow Rate	16.46	16.46	16.66	1.2	15.0	18.4	
Bypass/Aux Flow Rate	13.43	13.43	13.67	1.8			
Main Flow Rate	3.00	3.00	2.99	-0.3	2.7	3.3	
Total Flow Rate	16.51	16.51	16.66	0.9	15.0	18.4	

Comments: None.

### TABLE A-1

## GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE PERFORMANCE AUDIT CRITERIA

Measurement Variable		Evaluation Criteria			
Wind Speed		At ws $\leq$ 5 m/s, input $\pm$ 0.25 m/s; At ws $>$ 5 m/s, input $\pm$ 5% Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor and NRG Max 40H			
Wind Direction		input $\pm$ 5° Starting threshold: 0.5 m/s; R. M. Young 05305 Wind Monitor AQ Starting threshold: 1.0 m/s; R. M. Young 05103 Wind Monitor			
Temperature		input $\pm$ 0.5° C input $\pm$ 2.0° C for PM-10, PM-2.5 samplers			
Relative Humidity		Ambient: input $\pm$ 5% RH, $\pm$ 1.5°C as dew point Gravimetry Lab: input $\pm$ 5%			
Precipitation		input $\pm 10\%$			
Barometric Pressure		Ambient: input $\pm$ 10 hPa TEOM: $\pm$ 10 mm mercury			
PM-10: Hi-Vol SSI, Partisol, BGI, PM-2.5		input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 4%; Design Flow $\pm$ 5%			
TEOM:	Total Flow Main Flow Bypass Flow	input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10% input $\pm$ 10%; Design Flow $\pm$ 10%			
TEOM:	Leak Check	Main Flow: < 0.15 LPM Bypass Flow: < 0.60 LPM			

### Appendix B

### GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT QUALITY ASSURANCE CERTIFICATIONS OF AUDIT DEVICES

### **AUDIT DEVICE**

	Serial #	Cal Date:	Slope:	Intercept:
BGI Delta CAL: Date of first use 1/12/11	123	12/22/09	1.0	0.0
BGI Delta CAL:	525	1/4/11	1.0	0.0
Testo 735-1	01467895/712	12/16/10	1.0006	0.0209
Barigo Altimeter/Barometer:	P9	12/17/10	1.0	0.0
RM Young wind speed motor:	CUO1, HSO1 12/3/10 N/A		N/A	N/A
Cole-Parmer 3312-40 Psychrometer:	RH 03	12/10/04	Wet 1.0037 Dry 1.0059	Wet -0.0598 Dry -0.1518
Texas Electronics FC-525 Precipitation:	52202	N/A		

	1	apered	Element Osci	llating Microba	alance (TEOM)		
			FLC	OW AUDIT		V SUCKES THE INC. OF	in the fact of
		1100			1	T	T T
Date	1 12/11			Site Name	CAN	, ,	<del>                                     </del>
Start	111945	PST		Operator	100111	) /	
Finish	10:00	PST			: SB270	mani	
	Miles		<del></del>	Site Elevation		ft	<del> </del>
				Amb. Press.		in. Hg	
		1		Amb. Temp.			
			+	Tanb. remp.	1.7	deg. C	————i-
Prop. Or Ser. No.:	22614			Mako	: R&P		
Type:	PM10		<del> </del>		: 1400a		
				Last Cal. Date			
		+		Lust Cai. Date	14/2/10		
	- vv	Audit	Device(s)		1		
Make:	PCT THEOR			Make:	DOT THE	DOD :-	
	BGI INCOM	KPUKAI	<del>μ</del> υ		TOWN THUM	REORATED	
S/N:	OLLIA CAI	1	<del> </del>	Model:	DELLIA LA	1	
Range:	MALES!	Inn		S/N:	ULCO		
Calibration factors:	2 - 20	lpm		Range:	2 - 20	Ipm	
	2 02		Calib	ration factors:			
Slope:	1.0	J		Slope:			
Int.: Cal Date:	0.0	<b>d</b>		Int.:	L L L		
Cal Date:	16/2/0	1-		Cal Date:			
	40			L			
Q <sub>a</sub> =m[c	IPxT <sub>a</sub> /P <sub>a</sub> J <sup>1/2</sup> +b		Altitude Corr	ection Factor:	-1013		
Leak Check-Initial	Main:	107	Aux:	. 20			
Leak Check-Final	Main:		Aux:				
			Site		Nominal Fl	low Rates	
Audit	Audit Flow		Flow Rate	Diff.	Lower Limit		
Point	delta P	(VLPM)	(VLPM)	(%)	(LPM)	(LPM)	
Total Fow Rate	16.4%		299/13	17=161	<b>6</b> 15.0	18.4	
Aux. Flow Rate	13:43		13,27	1-1-6-6	7000-8		
Main Flow Rate	3.00		2.99		2.7	3.3	
Total Flow Rate	16.51		16.66		15.0	18.4	
	, , , ,	- '					
			Stan	dard			
	Sampler		True	Raw		<u></u>	
Amb Temp	7.9			7.3			
Amb Press	. 8911		905.62	9197			
	- U T			1011			———— <u>—</u>
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Comments:							
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Calibrated By:	20-1	7/					